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AMENDMENTS TO THE CLAIMS

1. (Previously Presented) A capacitive position sensor configured for interconnection to a utilization device, comprising:

a stationary signal-detecting capacitor plate;

a stationary signal-transmitting capacitor plate supported parallel to, and spaced apart from, the signal-detecting capacitor plate, the transmitting capacitor plate being divided into a plurality of electrically separated segments;

a non-circular, movable dielectric element disposed between the signal detecting and signal-transmitting capacitor plates;

an elongate member having a user-manipulable proximal end and a distal end coupled to the dielectric element, the member being operative to rotate and laterally shift the element in the x or y directions in a plane substantially parallel to the stationary plates as a function of user position;

circuitry in electrical communication with the stationary plates, the circuitry being operative to (a) measure the capacitance between each segment of the signal-transmitting plate and the signal-detecting plate, (b) determine the position of the elongate member in the x and y directions as a function of the measured capacitance, and (c) determine rotation of the elongate member as a function of the measured capacitance, with or without lateral shifting of the dielectric element; and

an output for communicating the x-y position and rotation to the utilization device.

2. (Original) The position sensor according to claim 1, wherein the utilization device is a computer.

3. (Original) The position sensor according to claim 1, wherein the elongate member is a user-graspable joystick.

4. - 5. (Canceled)

6. (Original) The position sensor according to claim 1, wherein the segments of the signal-transmitting plate are arcuate.

7. - 10. (Canceled)

11. (Previously Presented) A capacitive-based joystick configured for interconnection to a utilization device, comprising:

a housing having a top surface;

a stationary signal-detecting capacitor plate disposed within the housing;

a stationary signal-transmitting capacitor plate disposed within the housing parallel to, and spaced apart from, the signal-detecting capacitor plate, the transmitting capacitor plate being divided into a plurality of electrically separated segments;

a non-circular, movable dielectric element disposed within the housing between the signal-detecting and signal-transmitting capacitor plates;

a joystick lever supported for pivotal movement having a proximal end for user engagement and a distal end loosely coupled to the dielectric element, enabling the lever to rotate and laterally shift the dielectric element in x and y directions in a plane substantially parallel to the stationary plates as a function of user position;

circuitry in electrical communication with the stationary plates, the circuitry being operative to (a) measure the capacitance between each segment of the signal-transmitting plate and the signal-detecting plate, (b) determine the position of the elongate member in the x and y directions as a function of the measured capacitance, and (c) determine rotation of the elongate member as a function of the measured capacitance, with or without lateral shifting of the dielectric element; and

an output for communicating the user position to the utilization device.

12. (Original) The joystick according to claim 11, wherein the utilization device is a computer.

13. - 14. (Canceled)

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15. (Original) The joystick according to claim 11, wherein the segments of the signal-transmitting plate are arcuate.

16. (Original) The joystick according to claim 11, wherein the plurality of electrically separated segment includes 3 or 4 arcuate segments.

17. (Canceled)

18. (Previously Presented) The position sensor according to claim 1, wherein the dielectric element is oval or egg-shaped.

19. (Previously Presented) The position sensor according to claim 1, wherein the plurality of electrically separated segment includes 3 or 4 arcuate segments.

20. (Previously Presented) A capacitive position sensor configured for interconnection to a utilization device, comprising:

a stationary signal-detecting capacitor plate;

a stationary signal-transmitting capacitor plate supported parallel to, and spaced apart from, the signal-detecting capacitor plate, the transmitting capacitor plate being divided into a plurality of electrically separated segments;

a movable dielectric element disposed between the signal detecting and signal-transmitting capacitor plates;

a user-manipulable member operative to laterally shift the dielectric element in a plane substantially parallel to the stationary plates as a function of user position;

circuitry in electrical communication with the stationary plates, the circuitry being operative to (a) measure the capacitance between each segment of the signal-transmitting plate and the signal-detecting plate, and (b) determine the user position of the user-manipulable member as a function of the measured capacitance;

the segments of the signal-transmitting plate being arranged as parallel segments in one direction; and

wherein user manipulation of the member causes the dielectric element to laterally shift in that direction relative to the parallel segments.

21. (Currently Amended) The position sensor according to claim 1, wherein:

the elongate member includes a pivoting coupling between the first and second ends of the elongate member; and

the distal end of the elongate member ~~element~~ is loosely coupled to the dielectric element so that the dielectric element remains in a plane substantially parallel to the stationary plates as the dielectric element is rotated or laterally shifted.

22. (Previously Presented) The position sensor according to claim 1, wherein:

the movement of dielectric element is constrained by the spacing of stationary plates so that the dielectric element remains in a plane substantially parallel to the stationary plates as the dielectric element is rotated or laterally shifted.

23. –26. (Canceled)

27. (Previously Presented) The capacitive position sensor according to claim 1, wherein the dielectric element has a periphery described by:

$$r(\theta) = r_0 + a_2\cos(2\theta) + a_3\cos(3\theta).$$

28. (Previously Presented) The joystick according to claim 11, wherein the dielectric element has a periphery described by:

$$r(\theta) = r_0 + a_2\cos(2\theta) + a_3\cos(3\theta).$$

29. (Previously Presented) The capacitive position sensor according to claim 20, wherein the user-manipulable member includes a T-shaped handle.

30. (Previously Presented) The capacitive position sensor according to claim 20, further including:

a computer mouse housing having an upper surface; and

wherein user-manipulable member extends through the upper surface of the housing forming a scroller lever or wheel.

31. (Previously Presented) The capacitive position sensor according to claim 20, wherein:

the dielectric element is non-circular, enabling the circuitry to determine twisting of the of the user-manipulable member as a function of the measured capacitance, with or without lateral shifting of the dielectric element.

32. (Currently Amended) A capacitive position sensor configured for interconnection to a utilization device, comprising:

a pair of assemblies, each including:

a stationary signal-detecting capacitor plate,

a stationary signal-transmitting capacitor plate supported parallel to, and spaced apart from, the signal-detecting capacitor plate, the transmitting capacitor plate being divided into a plurality of electrically separated segments,

a non-circular moveable dielectric element disposed between the signal detecting and signal-transmitting capacitor plates,

an elongate member having a shaft and a distal end coupled to the dielectric element, the member being operative to rotate the dielectric element in a plane substantially parallel to the stationary plates as a function of user position,

the shaft of one of the elongate members being substantially perpendicular to the shaft of the other;

a user-manipulable member operative to rotate one or both of the shafts; [[and]]

circuitry in electrical communication with all of the stationary plates, the circuitry being operative to (a) measure the capacitance between each segment of the signal-transmitting plate and the signal-detecting plate associated with each one of the assemblies, and (b) determine the position of the user-manipulable member as a function of the measured capacitance; and

an output for communicating the position of the user-manipulable member to the utilization device.

33. (Previously Presented) The position sensor according to claim 32, wherein the user-manipulable member is a ball having an outer surface that frictionally engages with both of the shafts.

34. (Previously Presented) The position sensor according to claim 33, wherein:

the assemblies form part of a computer mouse having a housing; and

a portion of the outer surface of the ball extends beyond the surface of the housing.

35. (Previously Presented) The position sensor according to claim 33, wherein the utilization device is a computer.

36. (Previously Presented) The position sensor according to claim 1, wherein the segments of the signal-transmitting plate are arcuate.

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